THE IMPACT OF CONCUSSION INFORMATION ON PARENTS' DECISION REGARDING CHILD'S PARTICIPATION IN CONTACT SPORTS

A Thesis

by

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ABSTRACT

This study aimed to assess the impact of information about concussions on parents' decision to allow or not allow their child to participate in American (tackle) football and soccer (two of the most popular contact sports in America). The high rates of youth concussions have both medical personnel as well as sport managers concerned about concussions and how they impact health, participation levels at various stages, and parenting decisions. Following the Rational Choice Theory (RCT) parents are expected to make decisions for their child that will result in the greatest benefit to the child's overall health and well-being. The purpose of this study is to assess the impact of information on participant decisions regarding their child's involvement in contact sports. Seventy (70) parents of youth ages five (5) and under were randomly assigned to a control group and an experimental group. The control group was only given the survey and the experimental group was given the concussion fact sheet and the survey. Parents in the experimental group were significantly more likely to report intentions to delay their child's participation in soccer until after the age of six (6), and parents who had a female child were more likely to not allow their daughter to play American (tackle) football in comparison to parents who had a male child. The results from this study indicate that even when presented with concussion awareness information, parents are not always making decisions that result in the greatest benefit to their child's health and well-being. From a sport management perspective, this study makes it difficult for sport managers to justify spending money on concussion awareness for parents or coaches.

DEDICATION

I would like to dedicate this study to my family and friends for their continuous encouragement and support throughout this writing process.

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INTRODUCTION

Nearly 44 million youth participate in sports each year in the United States (Bryan, Rowhani-Rahbar, Comstock, & Rivara, 2016). With a vast number of youth participating each year in sports, injury is inevitable. In fact, it is estimated that between 1.1 and 1.9 million sports- and recreational-related concussions occur each year in youth eighteen years of age and younger in the United States (Bryan et al., 2016). A concussion is a mild traumatic brain injury (TBI) that results in the disturbance of brain function introduced by traumatic events that cause the brain to bounce around and twist inside of the skull (Centers for Disease Control and Prevention [CDC], 2017; Cripps & Livingston, 2017). Concussions are caused by a direct blow to the head, a direct blow to the body, and rotational acceleration (Aubry et al., 2002). Of these concussed individuals, females are more likely than their male counterparts to be concussed, and youth have a longer recovery time than adults (Lowrey & Morain, 2014; Prentice & Arnheim, 2006). Additionally, in the US children between the ages of six and sixteen are six times more likely to suffer a concussion while playing an organized sport than if they were playing recreationally (Albrecht, Lindback, & Strandet, 2013; Browne & Lam, 2006).

American (tackle) football and soccer are two of the most popular contact sports in America, yet have the highest concussion rates amongst all the sports. When taking a closer look at high school sports, the highest reports of concussions come from

participation in football, followed by girls' soccer, boys' soccer, and girls' basketball (Daneshvar, Nowinski, McKee, & Cantuet, 2011).

Even with all these alarming rates of concussive injuries, there is still a high rate of participation in youth contact sports before the age of seven. The problem that medical personnel are now facing is how to protect youth from injury because youth are more likely to obtain concussions and have a slower recovery period than adults (Albrecht et al., 2013; Browne & Lam, 2006; CDC, 2017a). Medical personnel are also facing the issue of repetitive head injuries causing health problems later in life such as Chronic Traumatic Encephalopathy (CTE), a neurodegenerative condition linked to multiple concussions or mild traumatic brain injuries (CDC, 2017b).

Sport managers have a vested interest in the issue of youth sport concussions, as injuries resulting from concussions impact current and future participation in sports. This, then, has a flow-on impact on individual and community physical and social health, and has far-reaching economic impacts, not limited to revenues from spectator sport. Thus, sport managers have a vested interest in reducing concussions among youth to keep children participating, and it is their duty to protect the youth and the future athletes of the adult professional leagues.

Given the number and severity of concussions in youth in the United States, there is a need to understand what contributes to parents' decisions to allow their child to participate, at what ages, and parental response to information regarding concussions. Parents may not be fully aware of the effects concussions can have on the health of their child, and therefore they continue to place their child in contact sports. This study will

analyze parents' decision-making in regard to allowing their child to participate in contact sports after obtaining information on concussions and the health effects associated with concussions. Parent's decision-making for their child can be fundamentally supported through the rational choice theory (RCT).

THEORETICAL FRAMEWORK

Rational choice theory (RCT) is a normative theory commonly used in many areas of study (Elster, 1986); a few of the main areas of study include economics, sociology, and physiology. RCT states that given any particular set of choices, an individual will act rationally and choose the most logical decision (Elster, 1986). All rational choices are based on a cost-benefit analysis from an individual level (Corradetti, 2012). Based on RCT, actions are predicted, but reasons behind actions cannot be explained (Elster, 1986). In sociology, George Homans was the first to introduce RCT to the sociology discipline. Through his work with RCT, he established an outline of the exchange theory that is still used today (Scott, Browning, Halcli, & Webster, 2000).

The benefit of RCT is that everything can be explained as a rational action. Every action, even those that appear to be irrational, is seen as being motivated by rationality and calculated in execution (Scott et al., 2000). Due to this, RCT is supported nearly in any circumstance. Another benefit of RCT is that researchers are able to break down complex social ideas into smaller actions performed by individuals. In turn, the individual actions that make up more complex social ideas are easier to understand and discuss (Scott et al., 2000).

Theorists believe that the theory gives an oversimplified view of what is considered to be rational, given certain disciplines such as economics (Corradetti, 2012). This oversimplified view of what is considered to be rational is a strength for this study because it allows the research team to clearly define rational parenting decisions. RCT

often overlooks irrational behaviors and more times than not, morals and emotions are ignored when speaking about the theory (Blau, 1997). Within RCT, individual rationality does not equate to a larger scale (i.e., collective rationality). This benefits the current study because it allows the research team to focus on the individual answers from each parent. Simply because an individual acted rationally does not necessarily indicate that similar individuals will follow suit and act rationally as well (Corradetti, 2012). RCT is incorporated into the present study as the explanatory framework. Using RCT, the aim for this study is to assess how likely parents are to allow their child or children to participate in American (tackle) football and soccer. Rational parenting decisions will result in the greatest benefit to the child's overall health and well- being. This study will allow sport managers to determine how gaining information about the potential for concussions and the negative health effects associated with concussions will impact parent's decisions to allow their child to participate in American (tackle) football and soccer.

APPLYING THE THEORY

It is important that we first understand the general idea of rational choices. The strategies to protect youth from concussions presented below, are drawn from research in other aspects of health behavior. Research demonstrates that four strategies to eat healthy would mimic the following layout. When given a healthy eating fact sheet to increase the reader's knowledge on how to eat healthy and the types of foods that are healthy to consume, it is expected that readers will 1) prohibit eating unhealthy completely, 2) delay unhealthy eating to a later age, 3) require themselves to plan healthy meals ahead of time to protect themselves from eating unhealthy, and/or 4) insist on proper nutrition training from a coach to better educate them on appropriate ways to eat healthy (CDC, 2015a). Similar to the strategies of protecting youth from concussions, the strategies to eat healthy can have both positive and negative effects on health and overall well-being. These are described below.

To prohibit eating unhealthy food all together is a great option for one's health. By choosing this option, people set themselves up for an overall healthier life. By not eating unhealthy food at all, it eliminates a lot of foods high in calories and sugar that are often linked to health issues such as obesity and cardiovascular disease. ("Diet, Nutrition and the Prevention of Chronic Diseases," 2004). Though this a great option for better health, it is often seen as unrealistic for many people and something that is not sustainable over long periods of time. Though this would give them great overall health, it would force them to make sacrifices to live a healthier lifestyle.

Delaying eating unhealthy food until later in life is also an option that can initially help their health but seems unrealistic in the long run. Similar to not eating unhealthy foods at all, this option eliminates foods linked to health issues early in life. This option would help in the beginning, but seems unrealistic because people who start eating healthy often maintain healthy choices throughout their life (U.S. Department of Health & Human Services [HHS], 2017). The downside to this option would be that one's health later in life might deteriorate more quickly due to old age and poor eating choices.

To require themselves to plan healthy meals ahead of time is a great option for those trying to change their eating habits. This option is impressive because it sets them up for success by not having to worry about finding something to eat last minute and protects themselves from unhealthy options (CDC, 2015a). The downside to this option is that if people do not have a lot of time for preparing the meals, they may fall back to eating unhealthy choices.

Insisting on proper nutrition coach training is an option to help better educate themselves on healthy foods and eating habits. By making themselves aware of healthy eating habits and aware of hidden bad foods, this option can help to reduce the amount of unhealthy eating. Similar to other health fields, nutrition coaches can also help to keep them accountable for what they eat (CDC, 2015b). The downside to this option is that it can be costly to hire a doctor or nutritionist. It can also be difficult for people to find time in their work schedule to go meet with a doctor or nutritionist. By doing one or a combination of these four options, people can improve their health and well-being.

These strategies to prohibit, delay, require, and insist can then be taken and directly applied to strategies for parents to protect their child from concussions.

STRATEGIES TO PROTECT YOUTH

Utilizing the example above, many of the same strategies of changing to healthier eating habits can be applied to the strategies used to protect youth from concussion. Just as eating healthy is a task that many people struggle to do at all let alone consistently, protecting youth from concussions is a task that parents struggle to do. Using this same logic, we could create strategies for protecting children from concussions that are based on rational choices for healthy behaviors. For this study, rational behavior is operationally defined as the parenting decision that will result in the greatest benefit to the child's overall health and well-being. When given a concussion fact sheet, it is expected that parents of youth will make a rational choice to do one or more of the following in order to reduce their child's risk of concussions: 1) prohibit their child's participation completely, 2) delay their child's participation to a later age, 3) require their child to wear protective gear, and/or 4) insist on proper coach training to better educate the players on appropriate playing technique. Each of these behaviors will help to reduce the likelihood of concussions that their child may obtain from contact sport participation.

First, parents prohibiting their child's participation all together is ideal for concussion prevention. This option completely eliminates their child's risk of obtaining sport- and recreational-related concussions from contacts sports. This also prevents any of the negative health effects now and later in life, such as CTE which is associated with concussions and repetitive head injuries. Dr. Bennett Omalu, who discovered CTE, says

that there is no reason for children under the age of eighteen to participate in high-contact collision sports like American (tackle) football (Wisner, 2017). Though this is an effective way to control the youth concussion issue, it is not very practical. Prohibiting participation all together may not be realistic, or desirable to a child who wants to participate in sports. Another downside to this option is that the lack of participation may cause the child to be inactive which can lead to other health issues later in life such as obesity, diabetes, and heart disease (CDC, 2016).

From a sport management standpoint, prohibiting participation does not fare well. Parents prohibiting youth participation completely have the potential to drastically reduce the pool of athletes in the professional leagues, the revenue streams on various league levels, and the availability of sport management jobs. In comparison to youth who participate in a low amount to no sports, youth who participate in a high amount of sports are eight times as likely to continue being active at the age of twenty-four (Perkins, 2004). This number is important because if there is a decrease in youth participation, it can reduce the pool of athletes that go to the professional leagues as well as revenue streams at the various levels. With less revenue coming in, youth and professional leagues may not have the resources to hire as many staff members as they have in the past, reducing the jobs available to sport managers. By parents preventing their youth from participating in contact sports, professional leagues such as the National Football League (NFL) and Major League Soccer (MLS) may feel the effects of reduced participation numbers in the near future. Therefore, completely prohibiting participation

may not be the best answer to the youth concussion problem from an individual and sport management perspective.

Parents delaying their child's participation to a later age has great value. Not only does it allow children to participate, but it also allows for necessary development to occur before participation begins. The greatest benefit to this option is the child's ability to mature physically and mentally before starting to participate. Children lack the basic motor skills needed for organized sports before the age of six (Healthy Children, 2015). Along with limited attention span, balance, and ability to track moving objects, children entering organized sports too early may be at a greater risk for injury (Healthy Children, 2015). Other doctors, such as Dr. Robert Cantu, have even encouraged parents to delay their child's participation until the age of fourteen due to the fact that a child's brain is less developed than an adult's (Gregory, 2016). Thus, the parental decision to delay participation helps to prevent concussions and gives children the opportunity to physically and mentally mature before participating.

The downside to this option is the impact on the revenue of youth leagues. This option will decrease the revenue youth leagues make because they are not collecting the money they normally would from young children participating. If revenue and participation levels become too low, some youth leagues may cease to exist. Another major criticism of this option is the game development of youth athletes. Some believe that early participation in a sport will better develop the necessary skills to play. By delaying participation, parents are delaying the development of game-related skills. This can put children who decide to participate later in life at risk for injury when they

compete against children who have already developed those game-related skills (Gregory, 2016). Thus, delaying participation to a later age has both advantages and disadvantages to consider.

Parents requiring their child to wear protective gear also has great potential to create a safer playing environment. Wearing protective gear while playing has created a growing consumer market for parents of youth sport participants. Protective gear was already available, but with the recent emphasis on concussion prevention, protective gear sales have recently grown substantially (Delgado, 2012; USA Football, n.d.). Research regarding protective gear and how to make playing safer for athletes has also grown with the increased awareness of concussions (Bonfield, 2015). In American (tackle) football the following equipment is required to be worn by youth participants: helmet, chinstrap, mouthpiece, shoulder pads, tailbone pad, hips pads, knee pads, and thigh pads (Bradley, 2017). For soccer, only shin guards are required to be worn, but head gear is becoming more common, yet still optional (Grahame, 2017). Though youth leagues require participants to wear protective gear, it is ultimately up to parents to ensure that their child is wearing the necessary equipment every practice and game.

The benefit to parents requiring their child to wear protective gear is that their child still gets to participate. Children may also feel safer wearing protective equipment, which can help them to be more comfortable and confident on the playing field. In both American (tackle) football and soccer, the helmet and head gear are to be worn to help prevent skull fractures, subdural hemorrhages, and concussions (Bonfield, 2015). The effectiveness of helmets and head gear in preventing concussions is still under debate

because there is no conclusive evidence showing that helmets reduce the risk of concussions, however, helmets and head gear can only help and not hurt in preventing concussions (Bonfield, 2015; Navarro, 2011). The growth in the protective gear industry also has the potential to create numerous jobs and generate additional money within the sport management field. One downside of protective gear is that it is initially costly to buy. Another downside is that if it is not sized correctly, worn correctly, or worn every time the equipment may not be as successful at preventing concussions and other injuries (USA Football, 2010).

Last, insisting on proper coach training to better educate the players on appropriate playing technique has the ability to transform youth sports. A benefit to this option is its ability to produce higher quality and better educated coaches. The greatest benefit of quality coach training is the ability to reduce the number of concussions seen in youth contact sports. This option may also have a positive effect on job availability. Youth sport leagues can hire personnel who are experts in the given sport to educate the coaches who then go out and teach the youth players. The downside to this option is that it can be costly in in terms of money and time, which may deter good coaches from coaching youth teams.

The most well-known football program is Heads Up Football, which was developed by USA Football to promote athlete safety. The program promotes safety by educating coaches, parents, and athletes on appropriate playing techniques that are nationally endorsed (USA Football, 2017). The Heads Up Football program also focuses on concussion awareness, properly fitted equipment, teaching the athletes proper

technique, heat concerns, and guidelines about contact during practices (Blackburn, 2014). From an educational standpoint, Heads Up Football partners with youth leagues, such as Pop Warner Football, to require coaches to become certified before they can begin working with the youth athletes.

When the Heads Up Football program initially launched in 2012, a research study was conducted to examine the effectiveness of the program (Kerr et al., 2015). The research study followed three groups over the 2014 football season. Group one was a part of Pop Warner football and followed Heads Up Football guidelines about restricting contact during practices, group two was not a part of Pop Warner football, but followed the Heads Up Football guidelines, and group three was not a part of Pop Warner football and did not follow Heads Up Football guidelines. This study found that group one which was a part of Pop Warner football and followed Heads Up Football guideline had the lowest rate of concussions and group three which was not a part of Pop Warner football and did not follow Heads Up Football guidelines had the highest rate of concussions (Kerr et al., 2015). This study showed that Heads Up Football was making strides to create a safer sport for youth athletes.

This study aims to identify which of these strategies parents would apply in making a participation decision for their own child when given information about the prevalence and outcomes of concussions. In accordance with RCT, as parents' knowledge increases, the likelihood of parents' choosing contact youth sport participation for their children decreases. The hypotheses for this study are the following:

H_1: As a parent's knowledge increases with the concussion fact sheet, they will be more likely to report an intention to decrease their child's participation in contact sports.

H_2: As a parent's knowledge increases with the concussion fact sheet, they will be more likely to report an intention to decrease their child's early participation (before the age of seven) in contact sports.

H_3: As a parent's knowledge increases with the concussion fact sheet, they will be more likely to report an intention to increase the use of head gear in contact sports.

H_4: As a parent's knowledge increases with the concussion fact sheet, they will be more likely to report an intention to increase their desire to require coaches to have proper coach training.

H_5: As a parent's knowledge increases with the concussion fact sheet, they will be more likely to report an intention to deny girls from participating in contact sports as opposed to boys.

ADDITIONAL MODERATING FACTORS

Given that parents vastly differ in age, gender, socioeconomic status (SES), and race, it is important to consider the impact of these moderating factors on parent decisions. The moderating factors that this study examines are the age, gender, SES, and race of the parent. Based on previous research (Coleman and Karraker, 2000) parents who are older, female, of higher SES, or Caucasian, are more likely to act rationally in their decision to allow their child to participate in contact sports.

The moderating factors will affect the relationship between the independent variable (i.e., parents' knowledge about concussions) and the dependent variable (i.e., parents' decision about child participation) in the following ways:

H_{1a}: A parent's age, gender, SES, and race will moderate the relationship between the independent variable (parents' information about concussions) and the dependent variable (parents' decision about child's participation) such that parents who are older, female, higher SES, and Caucasian will be more likely to prohibit their child's participation completely.

H_{2a}: A parent's age, gender, SES, and race will moderate the relationship between the independent variable (parents' information about concussions) and the dependent variable (parents' decision about child's participation) such that parents who are older, female, higher SES, and Caucasian will be more likely to delay their child's participation.

H_{3a}: A parent's age, gender, SES, and race will moderate the relationship between the independent variable (parents' information about concussions) and the dependent variable (parents' decision about child's participation) such that parents who are older, female, higher SES, and Caucasian will be more likely to require their child to wear protective gear while participating.

H_{4a}: A parent's age, gender, SES, and race will moderate the relationship between the independent variable (parents' information about concussions) and the dependent variable (parents' decision about child's participation) such that parents who are older, female, higher SES, and Caucasian will be more likely to insist on proper coach training.

Figure 1 shows the hypothesized relationship between the independent variable (parents' knowledge about concussions) and the dependent variable (parents' decision about child participation). Figure 1 also shows the moderating factors that alter the independent and dependent variables.

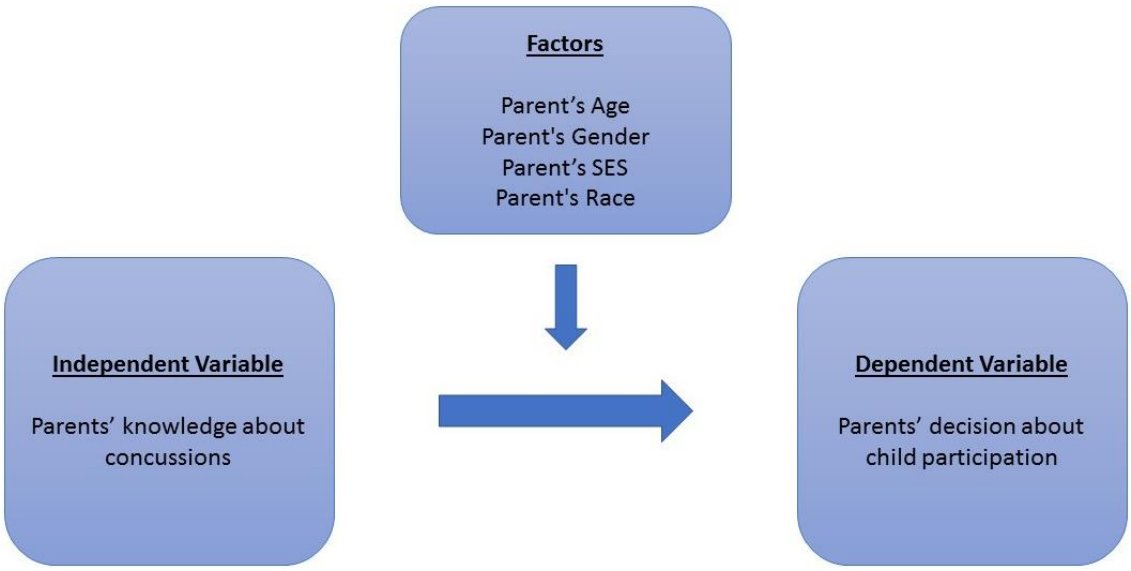


Figure 1: Conceptual framework of parents' decision-making about children's sport participation

METHOD

Recruitment

Parents with children under the age of five and under were the target population for this study, because their children had not yet started participation in organized sports, therefore the parents were starting on a blank slate in regard to sports participation. Due to this "blank slate," parents had less factors influencing their decision to allow their child to participate in contact sports. There were two factors that this study was trying to avoid. First, the child had already begun participating in a season of contact sports and wanted to continue playing. Second, the child has friends in the contact sport, and attempts to influence their parent's decision to allow them to participate. The study was designed to avoid these factors by restricting the age of the child to five and younger and by having questions on the survey that directly asked parents if their child had already begun participating in American (tackle) football and/ or soccer. Parents' whose child was over the age of five were excluded from this study. Parents' whose child had already begun to participate in American (tackle) football and/ or soccer were also excluded from this study.

Participants were randomly assigned to either the control group (Group 1) or the experimental group (Group 2) and did not know what group they were assigned to. Not informing participants of their group assignments was a way to prevent bias answers from participants.

Participants in the control group were given a one-time survey (see Appendix A) about their child's participation in contact sports to complete. The survey took participants approximately 5-10 minutes to complete. The control group was set in place to help verify if parents' decisions were a result of reading the concussion fact sheet.

Participants in the experimental group were given an information sheet (concussion fact sheet, see Appendix B) with facts about concussions and the health effects associated with concussions. Once the concussion fact sheet was read, participants completed the same one-time survey about their child's participation in contact sports. Reading the concussion fact sheet took approximately 3-5 minutes and the survey took participants approximately 5-10 minutes to complete. Thus, the total time commitment of participants in the experimental group was approximately 15 minutes.

Procedure

This study obtained approval from the Institutional Review Board (IRB) on November 21, 2017. Once approval was obtained, the research team utilized email and direct contact to recruit participants. An email was sent to day care centers and gyms to ask for permission to gain access to potential participants; these locations were selected because young children attend day care centers and gyms often have child care faculties within them. If an email was not listed, the research team physically went to the facility and directly ask the facility for permission. Once permission was obtained from the day care center or gym, the research team set up a table at the facility where they verbally

described the study to parents. If parents agreed to participate in the study, they were then given an informed consent on paper to read through and sign with a pen. Participants were given as much time as they needed to ask questions and to read and fully understand the informed consent. Participants then completed the survey with paper and pen at the facility. Once the participant completed the survey, the response was then inputted into Qualtrics by the research team.

Potential participants were also notified about the study through Texas A&M University bulkmail and social media posts. If parents responded to the email sent through bulkmail or social media posts, they were then given an informed consent online through Qualtrics to read through and sign. Participants were given as much time as they needed to ask questions and to read and fully understand the informed consent. Participants then completed the survey online through Qualtrics.

Participants

There was a total of one hundred and nineteen (119) participants who took the survey. Forty-nine (49) surveys were not used in this study due to incomplete answers, the child being over the age of five, or their child had already begun participating in American (tackle) football and/or soccer. Seventy (70) surveys were used to conduct analysis for this study. The average age of the participants was 29.91± 6.02 years, fourteen (20.00%) were male, fifty-six (80.00%) were female, and the average income was between $40,000 and $59,000. Of the participants, fifty-three (75.71%) were Caucasian or White, nine (12.86%) were Hispanic or Latino, five (7.14%) were African

American or Black, zero (0.00%) were American Indian or Alaska Native, zero (0.00%) were Native Hawaiian or Pacific Islander, two (2.86%) were Asian, and one (1.43%) was Other. Forty-five (64.29%) participants reported having a son and twenty-five (35.71%) participants reported having a daughter.

Of the seventy usable surveys, forty-two (60.00%) were a part of the control group and twenty-eight (40.00%) were a part of the experimental group. Table 1 shows the demographic breakdown of participants.

Factors	Descriptive
Age	29.91± 6.02 years
Gender	Male: 14 (20.00%) Female: 56 (80.00%)
Income	$40,000 and $59,000
Race	Caucasian or White: 53 (75.71%) Hispanic or Latino: 9 (12.86%) African American or Black: 5 (7.14%) American Indian or Alaska Native: 0 (0.00%) Native Hawaiian or Pacific Islander: 0 (0.00%) Asian: 2 (2.86%) Other: 1 (1.43%)
Child Gender	Boy: 45 (64.29%) Girl: 25 (35.71%)
Group	Control Group: 42 (60.00%) Experimental Group: 28 (40.00%)

Table 1: Demographic characteristics

Instruments

A concussion fact sheet was created to inform parents about concussions and the health effects associated with concussions that can occur in youth. Information from the concussion fact sheet was collected from multiple government (e.g., CDC) and scholarly sources (e.g., Aubry, 2002) to ensure the integrity of the study (see Appendix C). The concussion fact sheet was given to participants in the experimental group to read through before answering the survey questions.

The survey was created on Qualtrics and was used to assess the impact of information about concussions, on parents' decision-making to allow or not allow their child to participate in American (tackle) football and soccer. The survey consisted of twenty-two questions constructed by the research team. Four questions were open ended, seven questions were closed ended, and eleven questions were a seven point Likert scale. On the Likert scale, one (1) represented extremely unlikely, two (2) moderately unlikely, three (3) slightly unlikely, four (4) neither likely nor unlikely, five (5) slightly likely, six (6) moderately likely, and seven (7) extremely likely.

Data Analysis

The data collected from the Qualtrics survey was exported into Excel. Once in Excel multiple independent sample t-test and multiple regressions were conducted using an alpha level of 0.05. The independent t-tests compared the results from the control group (no concussion fact sheet) to the results of the experimental group (concussion fact sheet).

Variables

The following variables are defined and operationalized below in Table 2.

Variable	Definition	Use
Youth	A person that is under eighteen (18) years of age	Used to differentiate children and adults
Parent	The legal guardian of the child	Used to clearly state who is allowed to participate in the study
Contact sport	American (tackle) football	Used to clearly state what sports are being studied
Early entrance of sports	Sport participation before the age of seven (&) years old	Used to be able to differentiate between various ages of sport participation
Independent variable	Parent's information about concussions	Represented as the concussion fact sheet given to the experimental group
Dependent variable	Parent's decision about child's participation in contact sports	Measured through questions on the survey
Control variable	Every parent is given the same Qualtrics survey	Used to ensure standardization of the survey
Moderating factors	Parent age, gender, SES, and race	Measured through questions on the survey

Table 2: Study variables with definition and use

RESULTS

H_1 stated that parents with increased knowledge are more likely to report an intention to decrease their child's participation in American (tackle) football and soccer. There was a difference between the averages of parent responses for American (tackle) football, but there was no significant difference between the control and experimental group. For soccer, there was minimal difference between the averages of parent responses, and there was no significant difference between the control and experimental group. Thus, the findings do not support H_1; this suggests the increase of knowledge about concussions did not affect parents' decision to not allow their child to participate in American (tackle) football or soccer. The results of the t-test are shown in Table 3.

Sport	p-value	Control Group	Experimental Group	Hypothesis
American (tackle) football	0.25	M = 4.48 SD = 2.42	M = 3.79 SD = 2.47	Not supported
Soccer	0.91	M = 5.48 SD = 1.82	M = 5.43 SD = 1.50	Not supported

Table 3: Likelihood of parents not allowing participation at all (H_1)

H_2 stated that parents with increased knowledge are more likely to report an intention to decrease their child's early participation (before the age of seven) in American (tackle) football and soccer. Multiple paired t-tests were run to see if there was a significant difference between the control and experimental group at various age levels (4-6 years, 7-9 years, 10-11 years, 12-14 years, and 15-18 years) for their child's participation in American (tackle) football and soccer. For American (tackle) football there was no significant difference between the control and experimental group for any of the various age levels. Thus, the findings do not support H_2; this suggests the increase of knowledge about concussions did not affect parents' decision to decrease their child's early participation in American (tackle) football. The results of the t-tests for American (tackle) football at the various age levels are shown in Table 4.

For soccer, there was no significant difference between the control group and the experimental group for all of the various age levels except at 4 to 6 years. Since there was a significant difference at the 4 to 6 years of age level, this supports H_2 and suggests that the increase of knowledge about concussions did affect parents' decision to decrease their child's early participation in soccer. The results of the t-tests for soccer at the various age levels are shown in Table 5.

Age Level	p-value	Control Group	Experimental Group	Hypothesis
4-6 years	0.22	*M* = 2.76 *SD* = 2.01	*M* = 2.18 *SD* = 1.85	Not supported
7-9 years	0.08	*M* = 3.26 *SD* = 2.40	*M* = 2.32 *SD* = 1.83	Not supported
10-11 years	0.08	*M* = 3.83 *SD* = 2.46	*M* = 2.82 *SD* = 2.04	Not supported
12-14 years	0.15	*M* = 4.5 *SD* = 2.36	*M* = 3.68 *SD* = 2.31	Not supported
15-18 years	0.32	*M* = 4.69 *SD* = 2.37	*M* = 4.12 *SD* = 2.41	Not supported

Table 4: Likelihood of parents delaying participation in American (tackle) football (H_2)

Age Level	p-value	Control Group	Experimental Group	Hypothesis
4-6 years	0.03	*M* = 5.88 *SD* = 1.43	*M* = 5.07 *SD* = 1.54	Supported
7-9 years	0.18	*M* = 5.88 *SD* = 1.47	*M* = 5.39 *SD* = 1.45	Supported
10-11 years	0.50	*M* = 5.79 *SD* = 1.52	*M* = 5.54 *SD* = 1.48	Supported
12-14 years	0.73	*M* = 5.81 *SD* = 1.55	*M* = 5.68 *SD* = 1.49	Supported
15-18 years	0.87	*M* = 5.81 *SD* = 1.55	*M* = 5.75 *SD* = 1.53	Supported

Table 5: Likelihood of parents delaying participation in soccer (H_2)

H_3 stated that parents with increased knowledge are more likely to report an intention to increase their child's use of head gear in American (tackle) football and soccer. There was minimal difference between the averages of parent responses for American (tackle) football, and there was no significant difference between the control and experimental group. For soccer, there was a difference between the averages of parent responses, but there was no significant difference between the control and experimental group. Thus, the findings do not support H_3; this means that the increase of knowledge about concussions did not affect parents' decision to require their child to wear protective head gear in American (tackle) football or soccer. The results of the t-test are shown in Table 6.

Sport	p-value	Control Group	Experimental Group	Hypothesis
American (tackle) football	0.75	M = 6.57 SD = 1.42	M = 6.68 SD = 1.25	Not supported
Soccer	0.39	M = 3.79 SD = 1.83	M = 4.18 SD = 1.89	Not supported

Table 6. Likelihood of parents requiring head gear use (H_3)

H_4 states that parents with increased knowledge are more likely to report an intention to increase their desire to require coaches to have proper coach training in American (tackle) football or soccer. Though there was a difference between the averages of parent responses for American (tackle) football, there was no significant difference between the control and experimental group. For soccer, there was minimal difference between the averages of parent responses, and there was no significant difference between the control and experimental group. Thus, the findings do not support H_4; means that the increase of knowledge about concussions did not affect parents' decision to increase their desire to require coaches to have proper coach training in American (tackle) football or soccer. The results of the t-test are shown in Table 7.

Sport	p-value	Control Group	Experimental Group	Hypothesis
American (tackle) football	0.49	*M* = 5.88 *SD* = 1.76	*M* = 6.18 *SD* = 1.74	Not supported
Soccer	0.79	*M* = 5.67 *SD* = 1.79	*M* = 5.79 *SD* = 1.95	Not supported

Table 7: Likelihood parents insisting on proper coach training (H_4)

H_5 stated that parents with girls opposed to boys, are more likely to deny their daughters from participating in the contact sports of American (tackle) football and soccer. For American (tackle) football, there was a difference between the averages of parent responses, as well as a significant difference between parents with a female child in comparison to parents with a male child. Thus the findings do H_5; this suggests the increase of knowledge about concussions did affect parent's decisions in allowing their daughters to participate in American (tackle) football.

For soccer, there was minimal difference between the averages of parental responses, and there was no significant difference between the parents with a female child in comparison to parents with a male child. Thus, the findings do not support H_5; this suggests the increase of knowledge about concussions did not affect parents' decision in allowing their daughters to participate in soccer. The results of the t-test are shown in Table 8.

Sport	p-value	Parents with Female Child	Parents with Male Child	Hypothesis
American (tackle) football	0.00	*M* = 2.96 *SD* = 2.44	*M* = 4.89 *SD* = 2.18	Supported
Soccer	0.82	*M* = 5.52 *SD* = 1.64	*M* = 5.42 *SD* = 1.74	Not supported

Table 8: Likelihood parents deny girls from participating in comparison to boys (H_5)

Moderating Factors

This study also examined four moderating factors which included the age, gender, socioeconomic status (SES), and race of the parent. The results of the multiple regressions are shown below.

H_{1a} stated that parents who are older, female, higher SES, and Caucasian will be more likely to prohibit their child's participation completely. Table 9 illustrates the correlation between the variables and Table 10 illustrates the results from the multiple regression test for American (tackle) football. For American (tackle) football, there was an R value of 0.27 and an R^2 value of 0.07 (1, 4). With an R^2 value of 0.07 this means that 7% of the variance of dependent variable is explained by the moderating factors.

		Parent Age	Parent Gender	Parent Income	Parent Race
	1.00	-0.05	-0.27	-0.06	0.05
Parent Age	-0.05	1.00	-0.17	0.60	-0.22
Parent Gender	-0.27	-0.17	1.00	-0.20	-0.15
Parent Income	-0.06	0.60	-0.20	1.00	-0.20
Parent Race	0.05	-0.22	-0.15	-0.20	1.00

Table 9: Correlation results for moderating factors effect on parents' decision to not allow child's participation in American (tackle) football (H_1a)

	Mean	Standard Deviation	N	Unstandardized Coefficient Beta	Standard Error	t	p-value
	4.20	2.45	70	7.13	1.31	5.44	0.00
Parent Age	29.91	6.02	70	-0.10	0.71	-2.29	0.03
Parent Gender	1.80	0.40	70	-1.63	0.71	-2.29	0.03
Parent Income	3.03	2.00	70	-0.08	0.14	-0.58	0.56
Parent Race	1.50	1.20	70	-0.07	0.19	-0.39	0.70

Table 10: Multiple regression results for moderating factors effect on parents' decision to not allow child's participation in American (tackle) football (H_1a)

Table 11 illustrates the correlation between the variables and Table 12 illustrates the results from the multiple regression test for soccer. For soccer, there was an R value of 0.10 and an R^2 value of 0.01 (1, 4). With an R^2 value of 0.01 this means that 1% of the variance of dependent variable is explained by the moderating factors.

		Parent Age	Parent Gender	Parent Income	Parent Race
	1.00	-0.04	-0.03	-0.07	0.02
Parent Age	-0.04	1.00	-0.17	0.60	-0.22
Parent Gender	-0.03	-0.17	1.00	-0.20	-0.15
Parent Income	-0.07	0.60	-0.20	1.00	-0.20
Parent Race	-0.02	-0.22	-0.15	-0.20	1.00

Table 11: Correlation results for moderating factors effect on parents' decision to not allow child's participation in soccer (H_1a)

	Mean	Standard Deviation	N	Unstandardized Coefficient Beta	Standard Error	t	p-value
	5.46	1.69	70	6.34	1.72	3.68	0.00
Parent Age	29.91	6.02	70	-0.00	0.04	-0.05	0.96
Parent Gender	1.80	0.40	70	-0.26	0.54	-0.47	0.64
Parent Income	3.03	2.00	70	-0.08	0.14	-0.58	0.56
Parent Race	1.50	1.20	70	-0.07	0.19	-0.39	0.70

Table 12: Multiple regression results for moderating factors effect on parents' decision to not allow child's participation in soccer (H_1a)

H_{2a} states that parents who are older, female, higher SES, and Caucasian will be more likely to delay their child's participation. Table 13 illustrates the correlation between the variables and Table 14 illustrates the results from the multiple regression test for American (tackle) football. There was an R value of 0.27 and a R^2 value of 0.07 (1, 4). With a R^2 value of 0.07 this means that 7% of the variance of dependent variable is explained by the moderating factors.

		Parent Age	Parent Gender	Parent Income	Parent Race
	1.00	-0.07	-0.20	-0.14	0.021
Parent Age	-0.07	1.00	-0.17	0.60	-0.22
Parent Gender	-0.20	-0.17	1.00	-0.20	-0.15
Parent Income	-0.14	0.60	-0.20	1.00	-0.20
Parent Race	0.01	-0.22	-0.15	-0.20	1.00

Table 13: Correlation results for moderating factors effect on parents' decision to delay child's participation in American (tackle) football (H_2a)

	Mean	Standard Deviation	N	Unstandardized Coefficient Beta	Standard Error	t	p-value
	2.53	2.00	70	5.55	1.93	2.88	0.01
Parent Age	29.91	6.02	70	-0.01	0.05	-0.10	0.92
Parent Gender	1.80	0.40	70	-1.19	0.61	-1.96	0.05
Parent Income	3.03	2.00	70	-0.189	0.15	-1.25	0.22
Parent Race	1.50	1.20	70	-0.11	0.21	-0.55	0.59

Table 14: Multiple regression results for moderating factors effect on parents' decision to delay child's participation in American (tackle) football (H_2a)

Table 15 illustrates the correlation between the variables and Table 16 illustrates the results from the multiple regression test for soccer. For soccer, there was an R value of 0.21 and an R^2 value of 0.04 (1, 4). With an R^2 value of 0.04 this means that 4% of the variance of dependent variable is explained by the moderating factors.

		Parent Age	Parent Gender	Parent Income	Parent Race
	1.00	-0.04	-0.17	-0.02	0.05
Parent Age	-0.04	1.00	-0.17	0.60	-0.22
Parent Gender	-0.17	-0.17	1.00	-0.20	-0.15
Parent Income	-0.02	0.60	-0.20	1.00	-0.20
Parent Race	-0.05	-0.22	-0.15	-0.20	1.00

Table 15: Correlation results for moderating factors effect on parents' decision to delay child's participation in soccer (H_2a)

	Mean	Standard Deviation	N	Unstandardized Coefficient Beta	Standard Error	t	p-value
	5.56	1.52	70	7.82	1.52	5.14	0.00
Parent Age	29.91	6.02	70	-0.02	0.04	-0.49	0.63
Parent Gender	1.80	0.40	70	-0.78	0.48	-1.63	0.12
Parent Income	3.03	2.00	70	-0.03	0.12	-0.24	0.81
Parent Race	1.50	1.20	70	-0.14	0.16	-0.48	0.40

Table 16: Multiple regression results for moderating factors effect on parents' decision to delay child's participation in soccer (H_2a)

H_{3a} states that parents who are older, female, higher SES, and Caucasian will be more likely to require their child to wear protective head gear while participating. Table 17 illustrates the correlation between the variables and Table 18 illustrates the results from the multiple regression test for American (tackle) football. There was an R value of 0.14 and a R^2 value of 0.02 (1, 4). With a R^2 value of 0.02 this means that 2% of the variance of dependent variable is explained by the moderating factors.

		Parent Age	Parent Gender	Parent Income	Parent Race
	1.00	-0.01	-0.10	-0.05	0.10
Parent Age	-0.01	1.00	-0.17	0.60	-0.22
Parent Gender	-0.10	-0.17	1.00	-0.20	-0.15
Parent Income	-0.05	0.60	-0.20	1.00	-0.20
Parent Race	-0.10	-0.22	-0.15	-0.20	1.00

Table 17: Correlation results for moderating factors effect on parents' decision to require child to use protective head gear during participation in American (tackle) football (H_3a)

	Mean	Standard Deviation	N	Unstandardized Coefficient Beta	Standard Error	t	p-value
	6.61	1.34	70	6.32	1.36	4.63	0.00
Parent Age	29.91	6.02	70	0.01	0.04	0.13	0.90
Parent Gender	1.80	0.40	70	0.25	0.43	0.58	0.57
Parent Income	3.03	2.00	70	-0.04	0.11	-0.40	0.69
Parent Race	1.50	1.20	70	-0.10	0.15	-0.71	0.48

Table 18: Multiple regression results for moderating factors effect on parents' decision to require child to use protective head gear during participation in American (tackle) football (H_3a)

Table 19 illustrates the correlation between the variables and Table 20 illustrates the results from the multiple regression test for soccer. There was an R value of 0.31 and a R^2 value of 0.09 (1, 4). With a R^2 value of 0.09 this means that 9% of the variance of dependent variable is explained by the moderating factors.

		Parent Age	Parent Gender	Parent Income	Parent Race
	1.00	0.06	0.18	0.00	0.17
Parent Age	0.06	1.00	-0.17	0.60	-0.22
Parent Gender	0.18	-0.17	1.00	-0.20	-0.15
Parent Income	0.00	0.60	-0.20	1.00	-0.20
Parent Race	0.17	-0.22	-0.15	-0.20	1.00

Table 19: Correlation results for moderating factors effect on parents' decision to require child to use protective head gear during participation in soccer (H_3a)

	Mean	Standard Deviation	N	Unstandardized Coefficient Beta	Standard Error	t	p-value
	3.94	1.85	70	0.02	1.80	0.01	0.99
Parent Age	29.91	6.02	70	0.04	0.05	0.95	0.35
Parent Gender	1.80	0.40	70	1.12	0.57	1.97	0.05
Parent Income	3.03	2.00	70	0.01	0.14	0.10	0.92
Parent Race	1.50	1.20	70	0.38	0.19	1.95	0.06

Table 20: Multiple regression results for moderating factors effect on parents' decision to require child to use protective head gear during participation in soccer (H_3a)

H_{4a} states that parents who are older, female, higher SES, and Caucasian will be more likely to insist on proper coach training. Table 21 illustrates the correlation between the variables and Table 22 illustrates the results from the multiple regression test for American (tackle) football. There was an R value of 0.34 and a R^2 value of 0.12 (1, 4). With a R^2 value of 0.12 this means that 1.2% of the variance of dependent variable is explained by the moderating factors.

		Parent Age	Parent Gender	Parent Income	Parent Race
	1.00	-0.01	0.06	-0.23	0.20
Parent Age	-0.01	1.00	-0.17	0.60	-0.22
Parent Gender	0.06	-0.17	1.00	-0.20	-0.15
Parent Income	-0.23	0.60	-0.20	1.00	-0.20
Parent Race	0.20	-0.22	-0.15	-0.20	1.00

Table 21: Correlation results for moderating factors effect on parents' decision to insist on proper coach training in American (tackle) football (H_3a)

	Mean	Standard Deviation	N	Unstandardized Coefficient Beta	Standard Error	t	p-value
	6.00	1.75	70	3.81	1.68	2.27	0.03
Parent Age	29.91	6.02	70	0.07	0.04	1.62	0.11
Parent Gender	1.80	0.40	70	0.31	0.53	0.58	0.56
Parent Income	3.03	2.00	70	-0.29	0.13	-2.19	0.03
Parent Race	1.50	1.20	70	0.30	0.18	1.64	0.11

Table 22: Multiple regression results for moderating factors effect on parents' decision to insist on proper coach training in American (tackle) football (H_3a)

Table 23 illustrates the correlation between the variables and Table 24 illustrates the results from the multiple regression test for soccer. There was an R value of 0.24 and a R^2 value of 0.06 (1, 4). With a R^2 value of 0.06 this means that 6% of the variance of dependent variable is explained by the moderating factors.

		Parent Age	Parent Gender	Parent Income	Parent Race
	1.00	0.06	0.18	0.00	0.17
Parent Age	0.06	1.00	-0.17	0.60	-0.22
Parent Gender	0.18	-0.17	1.00	-0.20	-0.15
Parent Income	0.00	0.60	-0.20	1.00	-0.20
Parent Race	0.17	-0.22	-0.15	-0.20	1.00

Table 23: Correlation results for moderating factors effect on parents' decision to insist on proper coach training in soccer (H_3a)

	Mean	Standard Deviation	N	Unstandardized Coefficient Beta	Standard Error	t	p-value
	5.71	1.84	70	6.41	1.80	0.01	0.99
Parent Age	29.91	6.02	70	-0.23	0.05	0.95	0.35
Parent Gender	1.80	0.40	70	4.36	0.57	1.97	0.05
Parent Income	3.03	2.00	70	-0.28	0.14	0.10	0.92
Parent Race	1.50	1.20	70	0.38	0.19	1.95	0.06

Table 24: Multiple regression results for moderating factors effect on parents' decision to insist on proper coach training in soccer (H_3a)

A comprehensive list of the hypotheses and results is shown in Table 13.

Hypothesis	American (tackle) football	Soccer
H_1: As a parent's knowledge increase with the concussion fact sheet, they will be more likely to report and intention to decrease their child's participation in contact sports.	Not supported	Not supported
H_2: As a parent's knowledge increase with the concussion fact sheet, they will be more likely to report and intention to decrease their child's early participation in contact sports.	Not supported	**Supported**
H_3: As a parent's knowledge increase with the concussion fact sheet, they will be more likely to report and intention to increase the use of head gear in contact sports.	Not supported	Not supported
H_4: As a parent's knowledge increase with the concussion fact sheet, they will be more likely to report and intention to increase their desire to require coaches to have proper training.	Not supported	Not supported
H_5: As a parent's knowledge increase with the concussion fact sheet, they will be more likely to report and intention to deny girls from participating in contact sports as opposed to boys.	**Supported**	Not supported
H_{1a}: A parent's age, gender, SES, and race will moderate the relationship between the independent variable (parents' information about concussions) and the dependent variable (parents' decision about child's participation) such that parents who are older, female, higher SES, and Caucasian will be more likely to prohibit their child's participation completely.	Not Supported	Not Supported
H_{2a}: A parent's age, gender, SES, and race will moderate the relationship between the independent variable (parents' information about concussions) and the dependent variable (parents' decision about child's participation) such that parents who are older, female, higher SES, and Caucasian will be more likely to delay their child's participation.	Not supported	Not supported
H_{3a}: A parent's age, gender, SES, and race will moderate the relationship between the independent variable (parents' information about concussions) and the dependent variable (parents' decision about child's participation) such that parents who are older, female, higher SES, and Caucasian will be more likely to require their child to wear protective gear while participating	Not supported	Not supported
H_{4a}: A parent's age, gender, SES, and race will moderate the relationship between the independent variable (parents' information about concussions) and the dependent variable (parents' decision about child's participation) such that parents who are older, female, higher SES, and Caucasian will be more likely to insist on proper coach training.	Not supported	Not supported

Table 25: Comprehensive hypotheses results

CONCLUSION

Discussion

This study was expected to show a statistically significant difference between the control and experimental group who received the concussion fact sheet. It was expected that parents who received the concussion fact sheet would act in a more rational manner when it came to their decisions about allowing their children to play the contact sports of American (tackle) football and soccer. For this study, parents would act in a more rational manner if they stop their child's participation, delay participation, require wearing protective head gear, and insist on proper training of the coach.

The majority of the results revealed no significant differences between the answers of the control and experimental group. The only findings that resulted in a significant difference was that parents in the experimental group were more likely to delay their child's participation in soccer until after the age of seven (7) and parents who had a female child were more likely to not allow their daughter to play American (tackle) football in comparison to parents who had a male child. In comparison to American (tackle) football, soccer is often times seen as a relatively safe sport and not seen as a sport that results in high rates of concussions (Froholdt, Olsen, & Bahr, 2009). The concussion fact sheet stated that soccer was the second leading sport in terms of concussions. The insight of this information, may have deterred parents from allowing their child to start participating in soccer before the age of seven (7). Parents not allowing their daughters to participate in American (tackle) football, was an expected result because tackle football is predominantly seen as a male only sport where females will get injured (Harris, 2001).

The moderating factors were expected to result in older, female, higher SES, or Caucasian parents being more likely to make rational choices about their child's participation. Colemen and Karraker (2000) argued that female parents had a higher parenting self-efficacy when they were better educated, higher SES, and had previous experience with children. The multiple regressions showed a relationship where female parents made more rational choices than male parents. For all of the hypotheses, females reported being more likely to stop their child's participation, delay participation, require wearing the protective head gear, and insist on proper training of the coach. This is important to note because when it comes to youth participation, youth leagues will know that mothers are more cautious to allow their child to participate in American (tackle) football and soccer. This can lead to stronger efforts in making mothers feel more comfortable about allowing their child to participate in contact sports. This can also lead to sport managers having different forms of advertisement that specifically target mothers in a different way than fathers. Lastly, this can lead to more informative discussions when talking with mothers than if they were talking with fathers which may motivate sport managers to implement parent education as a requirement to better educate the parents on how to properly wear equipment, prevent concussions, and how to treat concussions if one is obtained. As for the other moderating factors, age, SES, and race, there was not one relationship that was more prevalent than another.

From a health standpoint, this study is important because it provides initial evidence that parents are not necessarily making the best choices for their child's health and may not be acting rationally. Based off of the health behavior of eating healthy, this study was expecting to see parents prohibit their child's participation in American (tackle)

football and soccer, delay participation, require their child to wear protective gear, and insist on proper coach training. The results found in this study do not align with what was expected to be seen from the healthy eating behavior literature (CDC, 2015a). It was expected that parents would prohibit participation to eliminate the negative health effects associated with concussions similar to how prohibiting unhealthy eating eliminates the negative effects of eating bad ("Diet, Nutrition and the Prevention of Chronic Diseases," 2004). This study also expected to see parents delay their child's participation to reduce the number of concussions early in life similar to how delaying eating unhealthy can reduce the negative health effects associated with bad eating early in life (HHS, 2017). Lastly, it was expected to see parents insist in proper coach training to help prevent concussions similar to how proper nutrition coach training can help to reduce the amount of unhealthy eating habits (CDC, 2015b).

This study for the most part did not show significant results, which suggests that there was little to no impact of information on parents' decision-making. With this insignificant impact, the rate of youth concussions may stay at the current rate instead of decreasing. When it comes to concussion awareness, the results from this study may deter sport managers from hiring staff to train coaches on the matter because there was no significant difference between the answers of parents who received the concussion information and the parents who did not. The medium in which the information was given may play a significant role in the data results. The presentation of a concussion fact sheet on paper may be less effective than a video or PowerPoint presentation given to parents; this may lead to future research.

This study contributes back to sport management because it is important to see how youth sports may affect professional leagues in later years. Sport managers can take this study and expand upon it to see if there is a real and imminent threat to the sport management realm. From a youth league sport management perspective, there was a significant difference where parents were delaying their child's participation to the age of seven (7) for soccer. This has the potential to decrease revenues in the youth leagues because they have fewer participants.

For the most part the results of this study were not significantly different; this ultimately tells the research team that even with concussion awareness information, parents are not always making the most rational choices for their child. This is important to know as a sport manager because the duty to protect today's youth will even more so fall on the shoulders of sport managers. Even if parents are not making the most rational choices for their child, sport managers should pair up with well know organizations like Heads Up Football to help reduce the number of concussions and teach the proper playing techniques. Sport managers should also require all coaches to go through a coach training prior to being allowed to work with children. Lastly, Sport managers should require parents to go through a concussion information session as a requirement to sign their child up for the sport.

Limitations

Limitations of this study included: needing more participants, more fathers or male guardians to fill out the survey, and more data on female children. This study would have better statistical power if the number of usable data was increased. For this study, only 14

(20.00%) men took the survey. This is a limitation because the low number of men makes it difficult to analyze difference between mothers and fathers. Lastly, of the data collected only 25 (35.71%) of participants reported having daughters. Ideally this number would be closer to 50.00% to make analyzing the data more accurate.

Future Research

Future research for this study can be directed towards focusing on the individual moderating factors, collecting more moderating factors that may influence parental decision making, and collecting data over a wider range of parental ages, genders, socioeconomic statuses, and races. Future research with a larger and more diverse sample size will help the statistical power of this research.

Research can also be directed towards the growing field of youth disability sports, and the effectiveness of presenting the information in different forms such as a video, PowerPoint, a speech, or demonstration. If this research was continued, there needs to be a stronger manipulation which could take the form of a video, PowerPoint presentation, speech from an athlete who has suffered from concussions, or live demonstration. Manipulation checks are also needed to help determine if the information presented was taken in and understood by the parents prior to them taking the survey. Based off of the information found in this study, a follow up study focusing more on the qualitative side would also be helpful in further understanding the reasoning behind parents' decisions.

Due to the high rates of concussions in youth organized sports, the health of today's youth is on the line. The concussions that children suffer from may have lasting health

effects, and should be addressed with a sense of urgency and seriousness. Moving forward, the need for further education and research in youth concussions is a must.

REFERENCES

Albrecht, J. M., Lindback, M., & Strand, B. (2013). What physical education teachers and sport coaches should know about the assessment of concussions. *Physical & Health Education Journal*, *79*(2), 6-13.

Aubry, M., Cantu, R., Dvorak, J., Graf-Baumann, T., Johnston, K., Kelly, J., & ... Schamasch, P. (2002). Summary and agreement statement of the first international conference on concussion in sport, Vienna 2001. *The Physician.*

Blau, P. M. (1997). On limitations of rational choice theory for sociology. *American Sociologist*, *28*(2), 16-21.

Blackburn, M. (2014). Heads up football. *Interscholastic Athletic Administration*, *40*(4), 56-57.

Bonfield, C. M., Shin, S. S., & Kanter, A. S. (2015). Helmets, head injury, and concussion in sport. *The Physician and Sports Medicine*, *43*(3), 236-246. doi:10.1080/00913847.2015.1039922

Bradley, D. (2017, September 11). Equipment needed to play football. Retrieved October 10, 2017, from https://www.livestrong.com/article/337726-football-equipment-needed-to-play-football/

Browne, G. J., & Lam, L. T. (2006). Concussive head injury in children and adolescents related to sports and other leisure physical activities. *British Journal of Sports Medicine*, *40*(2), 163-168. doi:10.1136/bjsm.2005.021220

Bryan, M. A., Rowhani-Rahbar, A., Comstock, R. D., & Rivara, F. (2016). Sports-and recreation-related concussions in US youth. *Pediatrics, 138*(1), 1-8. doi:10.1542/peds.2015-4635

Centers for Disease Control and Prevention. (2015a, May 15). Planning meals. Retrieved September 20, 2017, from https://www.cdc.gov/healthyweight/healthy_eating/meals.html

Centers for Disease Control and Prevention. (2015b, November 25). Preventing chronic disease. Retrieved October 16, 2017, from https://www.cdc.gov/pcd/issues/2015/15_0251.htm

Centers for Disease Control and Prevention. (2016, December 15). Overweight & obesity. Retrieved October 12, 2017, from https://www.cdc.gov/obesity/

Centers for Disease Control and Prevention. (2017a, April 27). Traumatic brain injury & concussion. Retrieved June 10, 2017, from https://www.cdc.gov/traumaticbraininjury/get_the_facts.html

Centers for Disease Control and Prevention. (2017b, June 14). Traumatic brain injury & concussion. Retrieved July 1, 2017, from https://www.cdc.gov/traumaticbraininjury/outcomes.html

Coleman, P. K., & Karraker, K. (2000). Parenting self-efficacy among mothers of school-age children: Conceptualization, measurement, and correlates. (cover story). *Family Relations, 49*(1), 13-25.

Corradetti, C. (2012). Rational choice, capabilities and the morality of human well-being: The third way. *International Journal of Ethics, 8*(3), 317-329.

Cripps, A., & Livingston, S. C. (2017). Differentiating concussion from intracranial pathology in athletes. *Journal of Sport Rehabilitation*, *26*(1), 101-108.

Daneshvar, D. H., Nowinski, C. J., McKee, A., & Cantu, R. C. (2011). The Epidemiology of sport-related concussion. *Clinics in Sports.*

Delgado, F. J. (2012). Head first. *Team Business*, 4-8.

Diet, nutrition and the prevention of chronic diseases: Scientific background papers of the joint WHO/FAO expert consultation (Geneva, 28 January-1 February 2002). (2004). *Public Health Nutrition*, *7*99-250.

Elster, J. (Ed.). (1986). *Rational choice* (pp.1-4). Washington Square, NY, NY: New York University Press.

Froholdt A, Olsen O, Bahr R. Low risk of injuries among children playing organized soccer: a prospective cohort study. *The American Journal of Sports Medicine* [serial online]. June 2009; 37(6):1155-1160. Available from: MEDLINE Complete, Ipswich, MA. Accessed December 7, 2017.

Grahame, A. (2017, September 11). What basic gear is needed for soccer? Retrieved October 10, 2017, from https://www.livestrong.com/article/150017-what-basic-gear-is-needed-for-soccer/

Gregory, S. (2016, April 19). CDC to investigate when kids should start playing football. Retrieved October 11, 2017, from http://time.com/4298317/cdc-to-investigate-when-kids-should-start-playing-football/

Harris J. Playing the man's game: sites of resistance and incorporation in women's football. *World Leisure Journal* [serial online]. 2001; 43(4):22-29. Available from: SPORTDiscus with Full Text, Ipswich, MA. Accessed December 7, 2017.

Healthy Children. (2015, November 21). Is your child ready for sports? Retrieved September 1, 2017, from https://www.healthychildren.org/English/healthy-living/sports/Pages/Is-Your-Child-Ready-for-Sports.aspx

Kerr, Z. Y., Yeargin, S., Valovich McLeod, T. C., Nittoli, V. C., Mensch, J., Dodge, T., … Dompier, T. P. (2015). Comprehensive coach education and practice contact restriction guidelines result in lower injury rates in youth American football. *Orthopaedic Journal of Sports Medicine, 3*(7), 2325967115594578. http://doi.org.ezproxy.library.tamu.edu/10.1177/2325967115594578

Lowrey, K. M., & Morain, S. R. (2014). State experiences implementing youth sports concussion laws: Challenges, successes, and lessons for evaluating impact. *Journal of Law, Medicine & Ethics*, *42*(3), 290-296. doi:10.1111/jlme.12146

Navarro, R. R. (2011). Protective equipment and the prevention of concussion - What is the evidence. *Current Sports Medicine Reports (American College of Sports Medicine), 10*(1), 27-31.

Perkins, D. F., Jacobs, J. E., Barber, B. L., & Eccles, J. S. (2004). Childhood and adolescent sports participation as predictors of participation in sports and physical fitness activities during young adulthood. *Youth & Society*, *35*(4), 495-520.

Prentice, W. E., & Arnheim, D. D. (2006). The head, face, eyes, ears, nose, and throat. In *Arnheims principles of athletic training: A competency-based approach* (12th ed., pp. 881-890). Boston, MA: McGraw-Hill.

Scott, J., Browning, G. K., Halcli, A., & Webster, F. (2000). *Rational choice theory*.

USA Football. (n.d.). Partnership opportunities. Retrieved October 12, 2017, from https://www2.usafootball.com/pdfs/USA_Football_Sponsorship.pdf

USA Football. (2010). Equipment fitting. Retrieved August 14, 2017, from https://web.usafootball.com/health-safety/equipment-fitting

USA Football. (2017). A safer league is a better league. Retrieved August 14, 2017, from https://usafootball.com/programs/heads-up-football/youth/

U.S. Department of Health & Human Services (HHS), & President's Council on Fitness, Sports & Nutrition. (2017, January 26). Importance of good nutrition. Retrieved October 16, 2017, from https://www.hhs.gov/fitness/eat-healthy/importance-of-good-nutrition/index.html

Wisner, M. (2017, August 16). Letting kids play football is child abuse: 'Concussion' doctor. Retrieved October 12, 2017, from http://www.foxbusiness.com/features/2017/08/16/letting-kids-play-football-is-child-abuse-concussion-doctor.html

APPENDIX A

SURVEY

Concussion Information on Parents' Decision-Making

Start of Block: Control Group or Experimental Group

Q1 Please allow for the investigator to select one:

- ○ Group 1
- ○ Group 2

End of Block: Control Group or Experimental Group

Start of Block: Consent Form

Q2 **Title of Research Study:**

The impact of concussion information on parents' consent for their child to participate in contact sports

Investigators:

Eriana Garner and Dr. Marlene Dixon

Funded/Supported By:

This research is funded/supported by Texas A&M University.

Why are you being invited to take part in a research study?

You are being asked to participate because you are the parent/ legal guardian of a child or children under the age of five years old. This group of parents/legal guardians are being targeted because their child/ children are less likely to have already started participation in

sports and to have other factors influence their decision to allow their child/ children to participate in sports.

What should you know about a research study?

- Someone will explain this research study to you.
- Whether or not you take part is up to you.
- You can choose not to take part.
- You can agree to take part and later change your mind.
- Your decision will not be held against you.
- You can ask all the questions you want before you decide.

Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team.

Eriana Garner at 512-865-8283 or engarner@tamu.edu.

Dr. Marlene Dixon at 979-458-3941 or madixon@tamu.edu

This research has been reviewed and approved by the Texas A&M Institutional Review Board (IRB). You may talk to them at 1-979-458-4067, toll free at 1-855-795-8636, or by email at irb@tamu.edu, if:

- You cannot reach the research team.
- Your questions, concerns, or complaints are not being answered by the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research participant.
- You want to get information or provide input about this research.

Why is this research being done?

This research study aims to assess the impact of information about concussions, on parents' likelihood of allowing their child or children to participate in American (tackle) football and soccer (two of the most popular contact sports in America). This research study benefits parents/ legal guardian by informing the participant about concussions and health effects associated with concussions. The research study benefits from parents/ legal guardian participation by allowing the investigation team to assess how information on concussions effects parents' consent for their child to participate in contact sports.

How long will the research last?

We expect that you will be in this research study for one session of approximately 10-15 minutes.

How many people will be studied?

We expect to enroll about 50 people in this research study at this site. Approximately 100 people in the entire study nationally will be enrolled.

What happens if I say "Yes, I want to be in this research"?

Participants will be given an information sheet with facts about concussions and the health effects associated with concussions to read. Once the information sheet is read, participants will complete a one-time questionnaire. The questionnaire will take participants approximately 10-15 minutes to complete. The questionnaire is used to gauge parents/legal guardians' level of consent for allowing their child to participate in the contact sports. Participants will complete all aspects of this research study online. The research

study can be done anywhere at any time, as long as the participant has access to a computer. The research study will be completed no later than May 1, 2018.

What happens if I do not want to be in this research?

You can leave the research study at any time and it will not be held against you.

What happens if I say "Yes", but I change my mind later?

You can leave the research study at any time and it will not be held against you.

Is there any way being in this study could be bad for me?

The risks associated with participation in this research study are minimal to none. There is a very small likelihood that participants could be identified, but this risk has been minimized by password protection. There is also a risk that participants may feel emotional discomfort about making decisions for their child.

Will being in this study help me in any way?

We cannot promise any benefits to you or others from your taking part in this research study. However, possible benefits include informing participants about concussions in the youth population. Participants will be provided with information about concussions and the health effects associated with concussions.

What happens to the information collected for the research?

Efforts will be made to limit the use and disclosure of your personal information, including research study and other records, to people who have a need to review this information. We cannot promise complete privacy. Organizations that may inspect and copy your

information include the TAMU HRPP/IRB and other representatives of this institution. Texas A&M Sport Management department may also inspect and copy your information.

Q4 STATEMENT OF CONSENT

I agree to be in this study and know that I am not giving up any legal rights by electronically signing this form. The procedures, risks, and benefits have been explained to me, and my questions have been answered. I know that new information about this research study will be provided to me as it becomes available and that the researcher will tell me if I must be removed from the study. I can ask more questions if I want.

By typing your name below, you certify that you have read all of the above information and agree to participate in the study knowing that you can stop taking part in this study at any time.

Q5 Participant (parent) First and Last Name

_____

End of Block: Consent Form

Start of Block: Concussion Facts Sheet

Display This Question:

If Please allow for the investigator to select one: = Group 1

Q6 Please choose one of your children under the age of five and answer the following questions to the best of your abilities.

Display This Question:

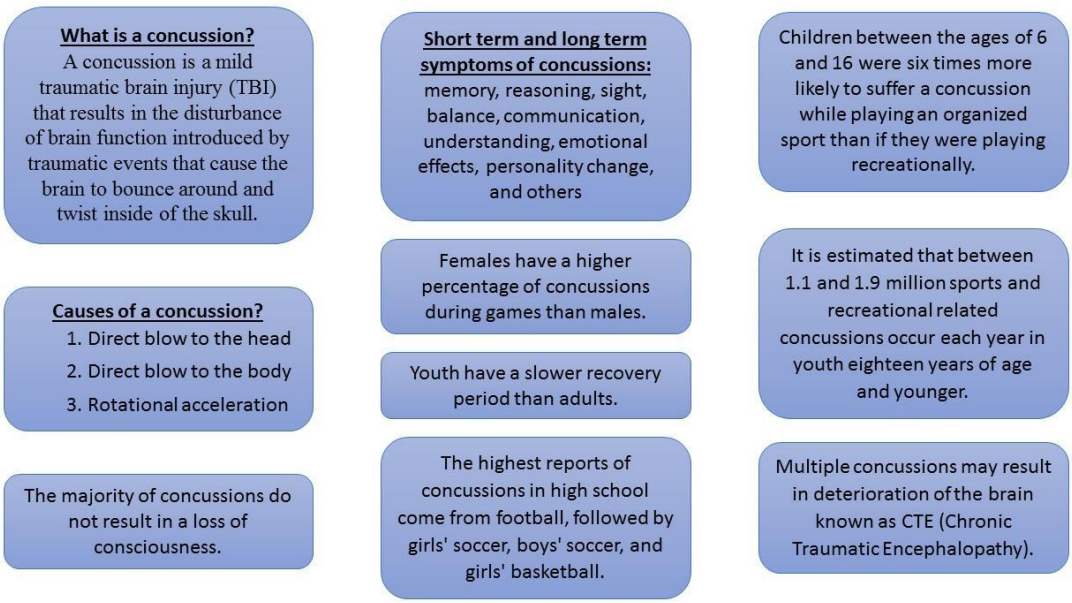
If Please allow for the investigator to select one: = Group 2

Q7 Please read the following information on concussions and the health effects associated with concussions.

Display This Question:

If Please allow for the investigator to select one: = Group 2

Q8



Display This Question:

If Please allow for the investigator to select one: = Group 2

Q9 Based off of the information given above, choose one of your children under the age of five and answer the following questions to the best of your abilities.

End of Block: Concussion Facts Sheet

Start of Block: Child Demographic Questions

Q10 How old is your child? (Ex. 6months, 2years) *if expecting please put zero*

_____

Q11 What is the gender of your child?

- ○ Male
- ○ Female

Q12 Please specify the race of your child.

- ○ White or Caucasian
- ○ Hispanic or Latino
- ○ Black or African American
- ○ American Indian or Alaska Native
- ○ Native Hawaiian or Pacific Islander
- ○ Asian
- ○ Other

Q13 Does your child already participate in American (tackle) football?

- ○ Yes
- ○ No

Skip To: End of Survey If Does your child already participate in American (tackle) football? = Yes

Q14 Does your child already participate in soccer?

- ○ Yes
- ○ No

Skip To: End of Survey If Does your child already participate in soccer? = Yes

End of Block: Child Demographic Questions

Start of Block: Big Idea Questions

Q15 At any point before the age of 18, how likely are you to allow your child to play these contact sports?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
American (tackle) football	○	○	○	○	○	○	○
Soccer	○	○	○	○	○	○	○

Q16 How likely are you to allow your child to play American (tackle) football at these various ages?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
The age of 4-6	○	○	○	○	○	○	○
The age of 7-9	○	○	○	○	○	○	○
The age of 10-11	○	○	○	○	○	○	○
The age of 12-14 (middle school football)	○	○	○	○	○	○	○
The age of 15-18 (high school football)	○	○	○	○	○	○	○

Q17 How likely are you to allow your child to play soccer at these various ages?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly likely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
The age of 4-6	○	○	○	○	○	○	○
The age of 7-9	○	○	○	○	○	○	○
The age of 10-11	○	○	○	○	○	○	○
The age of 12-14 (middle school soccer)	○	○	○	○	○	○	○
The age of 15-18 (high school soccer)	○	○	○	○	○	○	○

Q18 Briefly please explain why you were likely or unlikely to allow your child to participate in American (tackle) football.

_____

_____

_____

_____

_____

Q19 Briefly please explain why you were likely or unlikely to allow your child to participate in soccer.

_____

_____

_____

_____

_____

End of Block: Big Idea Questions

Start of Block: Additional Questions

Q20 How likely are you to require your child to wear protective gear (Ex. helmet, shoulder pads, mouth piece, etc..) while playing American (tackle) football?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
American (tackle) football	○	○	○	○	○	○	○

Q21 How likely are you to require your child to wear protective shin guards while playing soccer?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
Soccer	○	○	○	○	○	○	○

Q22 How likely are you to require your child to wear protective head gear while playing soccer?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
Soccer	○	○	○	○	○	○	○

Q23 How likely are you to postpone your child's' participation until 7 years of age or older for the following contact sports?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
American (tackle) football	○	○	○	○	○	○	○
Soccer	○	○	○	○	○	○	○

Q24 How likely are you to postpone your child's' participation until 10 years of age or older for the following contact sports?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
American (tackle) football	○	○	○	○	○	○	○
Soccer	○	○	○	○	○	○	○

Q25 How likely are you to postpone your child's' participation until 13 years of age or older for the following contact sports?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
American (tackle) football	○	○	○	○	○	○	○
Soccer	○	○	○	○	○	○	○

Q26 How likely are you to insist that your child's coach have formal training (Concussion awareness, CPR, heat concerns, proper playing technique) before working with your child for the following contact sports?

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
American (tackle) football	○	○	○	○	○	○	○
Soccer	○	○	○	○	○	○	○

Q27 State your level of agreement with the following statements:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I don't believe concussions will happen to my child.	○	○	○	○	○	○	○
I don't believe protective head gear is necessary for American (tackle) football.	○	○	○	○	○	○	○
I don't believe protective head gear is necessary for soccer.	○	○	○	○	○	○	○
I believe that the risks associated with American (tackle) football are acceptable because the benefits of playing outweigh the risks.	○	○	○	○	○	○	○
I believe that the risks associated with soccer are acceptable because the benefits of playing outweigh the risks.	○	○	○	○	○	○	○

End of Block: Additional Questions

Start of Block: Parent Demographic Questions

Q28 How old are you (parent)?

_____

Q29 What is your (parent) gender?

- ○ Male
- ○ Female

Q30 What is your (parent) annual income? *Only count your individual income, please do not include partner's income*

- ○ $19,999 or below
- ○ $20,000- $39,999
- ○ $40,000- $59,999
- ○ $60,000- $79,999
- ○ $80,000- $99,999
- ○ $100,000- $119,999
- ○ $120,000- $139,999
- ○ $140,000- $159,999
- ○ $160,000 or above

Q31 Please specify your (parent) race?

- ○ White or Caucasian
- ○ Hispanic or Latino
- ○ Black or African American
- ○ American Indian or Alaska Native
- ○ Native Hawaiian or Pacific Islander
- ○ Asian
- ○ Other

End of Block: Parent Demographic Questions

APPENDIX B

CONCUSSION FACT SHEET

What is a concussion?
A concussion is a mild traumatic brain injury (TBI) that results in the disturbance of brain function introduced by traumatic events that cause the brain to bounce around and twist inside of the skull.

Causes of a concussion?
1. Direct blow to the head
2. Direct blow to the body
3. Rotational acceleration

The majority of concussions do not result in a loss of consciousness.

Short term and long term symptoms of concussions: memory, reasoning, sight, balance, communication, understanding, emotional effects, personality change, and others

Females have a higher percentage of concussions during games than males.

Youth have a slower recovery period than adults.

The highest reports of concussions in high school come from football, followed by girls' soccer, boys' soccer, and girls' basketball.

Children between the ages of 6 and 16 were six times more likely to suffer a concussion while playing an organized sport than if they were playing recreationally.

It is estimated that between 1.1 and 1.9 million sports and recreational related concussions occur each year in youth eighteen years of age and younger.

Multiple concussions may result in deterioration of the brain known as CTE (Chronic Traumatic Encephalopathy).

APPENDIX C

CONCUSSION RESEARCH SHEET

1. What is a concussion?

   A concussion is a mild traumatic brain injury (TBI) that results in the disturbance of brain function introduced by traumatic events that cause the brain to bounce around and twist inside of the skull (CDC, 2017a; Cripps & Livingston, 2017).

2. What are the causes of a concussion?

   Concussion are caused by a direct blow to the head, a direct blow to the body, and rotational acceleration (Aubry, 2002).

3. Majority of concussions do not result in a loss of consciousness (Aubry, 2002).
4. Nearly 44 million youth participants in sports each year (Bryan, 2016). It is estimated that between 1.1 and 1.9 million sports and recreational related concussions occur each year in youth eighteen years of age and younger (Bryan, 2016).
5. Females have a higher percentage of concussions during games than males (Prentice & Arnheim, 2006).
6. Youth and the elderly have a slower recovery period than adults (CDC, 2017a).
7. The highest reports of concussions come from participation in football, followed by girls' soccer, boys' soccer, and girls' basketball (Daneshvar, 2011).
8. Children between the ages of 6 and 16 were six times more likely to suffer a concussion while playing an organized sport than if they were playing recreationally (Browne & Lam, 2006; Albrecht, Lindback, & Strandet, 2013).

9. Short term and long term symptoms of concussions: memory, reasoning, sight, balance, communication understanding, emotional effects, personality change, and others (CDC, 2017b).
10. Chronic Traumatic Encephalopathy (CTE) is a neurodegenerative condition linked to repeated mild traumatic brain injuries (TBI) (CDC, 2017b).
11. Once you have had one concussion, you at risk for another concussion (CDC, 2017a).
12. Some symptoms may appear right away while others may not be noticed for days or months after the injury, or until the person resumes their everyday life (CDC, 2017a).